

Free White Paper: Understanding How Geothermal Can Help you with your LEED Project

According to the [USGBC](#), the demand for Green Buildings is vast and increasing every year with millions of square feet of residential and commercial property being developed each year in the US alone. LEED is a point system used to rate building. There are 8 categories that can gain points and a large percentage of points can be delivered the energy and environment category, in which a geothermal system can gain you substantial points in three categories, space heating and cooling is one of them and should be of high importance for an HVAC professional, like yourself.

Space Heating and Cooling

The intent in LEED ratings for space heating and cooling equipment is to “reduce energy consumption associated with the HVAC system,” which means more efficient equipment and better building practices.

The efficiency requirements that you must meet with your heating and cooling system will depend on where you live. LEED requirements are broken up according to the U.S. Climate Zones, which are shown in Figure 1:

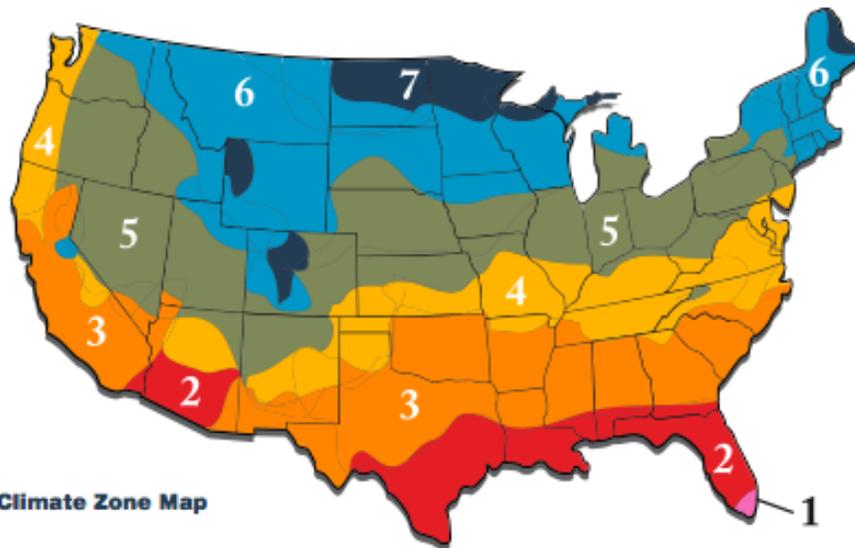


Figure 1. Climate Zone Map

Figure 1. Climate Zone Map

Climate Zones 1-3 are in the Southern, cooling-dominant regions of the United States. As you can see in Table 2, LEED cooling efficiency requirements (indicated by higher SEER and EER ratings) are more stringent in those areas.

	Possible Points	End Use	Central AC & ASHPs ¹	Furnaces ²	Boilers ²	Open Loop GSHP	Closed Loop GSHP	Direct Expansion GSHP
PREREQUISITE	NA	Cooling Heating	≥14 SEER ≥8.2 HSPF	≥80 AFUE	≥80 AFUE	≥16.2 EER ≥3.6 COP	≥14.1 EER ≥3.3 COP	≥15.0 EER ≥3.5 COP
HIGH EFFICIENCY	2	Cooling Heating	≥15 SEER ≥8.6 HSPF	≥90 AFUE	≥85 AFUE	≥17.8 EER ≥4.0 COP	≥15.5 EER ≥3.6 COP	≥16.5 EER ≥3.9 COP
VERY HIGH EFFICIENCY	3-4 ³	Cooling Heating	≥16 SEER ≥9.0 HSPF	≥92 AFUE	≥87 AFUE	≥19.4 EER ≥4.3 COP	≥17.0 EER ≥4.0 COP	≥18.0 EER ≥4.2 COP

Table 2. HVAC Requirements for IECC Climate Zones 1-3

1. ASHP = Air Source Heat Pump
2. Gas, oil, or propane
3. Heat pump systems qualify for the maximum of 4 points, all other systems can only obtain 3 points
4. Furnace with low electricity use

Table 2. HVAC Requirements for IECC Climate Zones 1-3

Climate Zones 4-8 are in the Northern, heating dominant regions of the country. As illustrated in Table 3, if you live in one of those Climate Zones, the heating efficiency requirements are increased as indicated by higher HSPF, AFUE, and COP ratings.

	Possible Points	End Use	Central AC & ASHPs ¹	Furnaces ²	Boilers ²	Open Loop GSHP	Closed Loop GSHP	Direct Expansion GSHP
PREREQUISITE	NA	Cooling Heating	≥13 SEER ≥8.2 HSPF	≥90 AFUE	≥85 AFUE	≥16 EER ≥3.6 COP	≥14.1 EER ≥3.3 COP	≥15.0 EER ≥3.5 COP
HIGH EFFICIENCY	2	Cooling Heating	≥14 SEER ≥8.6 HSPF	≥92 AFUE	≥87 AFUE	≥17.8 EER ≥4.0 COP	≥15.5 EER ≥3.6 COP	≥16.5 EER ≥3.9 COP
VERY HIGH EFFICIENCY	3-4 ³	Cooling Heating	≥15 SEER ≥9.0 HSPF	≥94 AFUE	≥90 AFUE	≥19.4 EER ≥4.3 COP	≥17.0 EER ≥4.0 COP	≥18.0 EER ≥4.2 COP

Table 3. HVAC Requirements for IECC Climate Zones 4-8

1. ASHP = Air Source Heat Pump
2. Gas, oil, or propane
3. Heat pump systems qualify for the maximum of 4 points, all other systems can obtain 3 points
4. Furnace with low electricity use

Table 3. HVAC Requirements for IECC Climate Zones 4-8

Generally speaking, as the efficiency of your heating and cooling system increases, the amount of LEED points awarded to you also increases. It is important to recognize that only heat pump systems can qualify for the maximum of four points for space heating and cooling equipment (GSHP efficiency requirements highlighted in red). All other systems can only obtain up to three points in this category.

Learn More

You can download the full white paper ["Let Geo LEED the way" here](#) to understand the role geothermal heating and cooling systems play in the achievement of LEED certification. The paper breaks down how LEED points are accumulated, the specific categories GSHP systems affect and how to maximize your points with GSHP. To find [geothermal training](#), taught by Ryan Carda of [GeoConnections](#) go to [HeatSpring Learning Institute](#)